

- 33 -

CLAIMS:

1. A method of assessing a sensory nervous system of a subject, including:

simultaneously presenting two or more parts of the sensory system with respective sequences of stimuli,

5 varying each sequence over time between a null stimulus and one or more less frequent non-null stimuli,

controlling the variation of each sequence so that neighbouring parts of the sensory system are less likely to receive simultaneous non-null stimuli,

measuring one or more simultaneous responses by the subject to the sequences of
10 stimuli, and

determining weight functions from the responses for assessment of the sensory system.
2. A method according to claim 1 wherein the non-null stimuli appear in each
15 sequence at a rate of about 0.25 to 25 per second.
3. A method according to claim 1 wherein the probability of neighbouring parts in the sensory system having simultaneous non-null stimuli is zero.
- 20 4. A method according to claim 1 wherein the sensory system is a visual system and multiple parts of a retina are presented with stimuli.
5. A method according to claim 1 wherein the sensory system is a visual system and the sequences includes either binocular or dichoptic stimuli.

- 34 -

6. A method according to claim 1 wherein the sensory system is an aural or tactile system and the ears or skin are presented with stimuli.

7. A method according to claim 1 wherein the parts of the sensory system are
5 in the retina, the ears, the skin, or in the brain of the subject.

8. A method according to claim 1 wherein the stimuli are selected from a range of signals such as light or sound frequency, or pressure.

10 9. A method according to claim 1 wherein the parts of the sensory system receiving stimuli form a region divided into classes and only one of the classes has a non-zero probability of receiving stimuli at any time.

10. A method according to claim 1 wherein the responses are nonlinear and the
15 weight functions are Wiener or Volterra kernels.

11. Apparatus for assessing a sensory nervous system of a subject, including:

a stimulator that simultaneously presents two or more parts of the sensory system with respective sequences of stimuli,

a monitor that measures one or more simultaneous responses by the subject to the
20 sequences of stimuli, and

a processor that varies each sequence over time between a null stimulus and one or more less probable non-null stimuli,

controls the variation of each sequence so that neighbouring parts of the sensory system are less likely to receive simultaneous non-null stimuli, and

25 determines weight functions from the responses for assessment of the sensory system.

12. Apparatus according to claim 11 wherein the sensory system is a visual, aural or tactile system and the stimulator presents optical patterns to the eyes, ears or skin of the subject.

5

13. Apparatus according to claim 11 wherein the monitor measures responses to the stimuli by way of electrode potentials on the head of the subject.